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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/759,180	01/20/2004	Takeshi Yamashita	740819-1041	7694

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NIXON PEABODY, LLP  
401 9TH STREET, NW  
SUITE 900  
WASHINGTON, DC 20004-2128

EXAMINER

CHEN, KIN-CHAN

ART UNIT	PAPER NUMBER
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1765

DATE MAILED: 12/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/759,180	Applicant(s) YAMASHITA ET AL.	
	Examiner Kin-Chan Chen	Art Unit 1765	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 21 November 2005.
- 2a) ☐ This action is FINAL.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) 8-13 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3,4,6 and 7 is/are rejected.
- 7) ☒ Claim(s) 2 and 5 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 09/826,098.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election of claims 1-7 on November 21, 2005 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jain et al. (US 6,180,533; hereinafter "Jain").

In a method for etching a trench, Jain teaches using a dry etching apparatus having a dual power source independently controlling source power and bias power. Jain teaches that a mask pattern having an opening corresponding to a region to be formed with an isolation may be formed on a silicon substrate. A process gas containing

Art Unit: 1765

at least oxygen may be used to etch and form a trench for isolation in the silicon substrate. See col. 7, lines 8-12; 45-50; col. 19; and Table eight,.

Jain teaches using separate controllers for source power and bias power in order to separately control the plasma generation and bombardment of the species onto the substrate. Therefore, the process produces good quality product and excellent critical dimension control. Hence, it would have been obvious to one with ordinary skill in the art that the defect of oxidation does not occur at an exposed portion of the silicon substrate. Furthermore, it would have been obvious to one with ordinary skill in the art that Jain applies the source power and bias power together (at same time) so as to generate the plasma and drive the reactive species to the substrate at timely manner and etch efficiently.

Claim 3 differs from the Jain by specifying various values for source power and bias power. However, same were known to be result-effective variables and commonly determined by routine experiment. The process of conducting routine experimentations so as to produce an expected result is obvious to one of ordinary skill in the art. In absence of showing criticality, a person having ordinary skill in the art would have found it obvious to modify the prior art by performing routine experiments (by using different values of source power and bias power) to obtain optimal result with a reasonable expectation of success.

4. Claims 4, 6, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yang et al. (US 6,515,328; hereinafter "Yang").

Art Unit: 1765

In a method of semiconductor device fabrication, Yang teaches using a dry etching apparatus having a dual power source independently controlling source power and bias power. Yang teaches that a conductive film containing at least silicon may be formed on a substrate. Yang teaches that a mask pattern covering a region to be formed with a gate electrode may be formed thereon. A process gas containing at least oxygen may be used to etch the conductive film and form the gate electrode. See abstract; col. 6, lines 10-22; col. 7, lines 1-10. Figs 6 and 7.

Yang teaches using separate controllers for source power and bias power in order to separately control the plasma generation and bombardment of the species onto the substrate. Therefore, the process produces good quality and improved control over the dimensions of gate electrodes. Hence, it would have been obvious to one with ordinary skill in the art that the defect of oxidation does not occur at an exposed portion of the conductive film (such as polysilicon). Furthermore, it would have been obvious to one with ordinary skill in the art that Yang applies the source power and bias power together (at same time) so as to generate the plasma and drive the reactive species to the substrate at timely manner and etch efficiently.

Claim 6 differs from the Yang by specifying various values for source power and bias power. However, same were known to be result-effective variables and commonly determined by routine experiment. The process of conducting routine experimentations so as to produce an expected result is obvious to one of ordinary skill in the art. In absence of showing criticality, a person having ordinary skill in the art would have found it obvious to modify the prior art by performing routine experiments

Art Unit: 1765

(by using different values of source power and bias power) to obtain optimal result with a reasonable expectation of success.

***Allowable Subject Matter***

5. Claims 2 and 5 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The most relevant reference in the list of prior art cited is Koshimizu (U.S. 6,426,477) who teaches that the bias power may be supplied in advance of starting the source power (abstract; col. 1, lines 6-10). However, the filing date of Koshimizu is September 12, 2000. The priority date of the current application, which is based on Japan patent application 2000-117502, is April 19, 2000. The certified copies of the priority documents and the verified English translation of the Japan patent application 2000-117502 were submitted by applicant in parent application 09/826,098. Therefore, the Koshimizu reference is predated by the present application.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kin-Chan Chen whose telephone number is (571) 272-1461. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on (571) 272-1465. The fax phone number

Art Unit: 1765

for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*December 16, 2005*



Kin-Chan Chen  
Primary Examiner  
Art Unit 1765